Routine use of the McGRA TH™ MAC video laryngoscope (VL) improves success rate, reduces time, and lessens hemodynamic response to intubation when compared to the traditional direct visualization (DL) technique. McGRA TH™ MAC VL provides greater visualization with a familiar Macintosh blade, preparing you for the unexpected during every intubation.
Review the evidence of the benefits associated with the McGRATH™ MAC video laryngoscope

**INCREASED FIRST PASS SUCCESS RATE**
- Kriege et al.
- Kleine-Brueggeney

**LESS HEMODYNAMIC INSTABILITY**
- Altun et al.
- Yokose et al.

**COST EFFECTIVE**
- Alsumaliet et al.

**AVOID DIFFICULT INTUBATIONS**
- De Jong et al.

**IMPROVED PERFORMANCE COMPARED TO OTHER VIDEO LARYNGOSCOPE**
- Alvis et al.
- Kleine-Brueggeney

**MAKE YOUR FIRST ATTEMPT YOUR BEST ATTEMPT WITH McGRATH™ MAC™ VIDEO LARYNGOSCOPY**

**Improve intubation success with routine use of McGRATH™ MAC video laryngoscopy**
- After failed tracheal intubation with direct laryngoscopy, video laryngoscopy is the most commonly used and most successful rescue technique (Figure 1)
- Compared to direct laryngoscopy, routine use of the McGRATH™ MAC video laryngoscope has demonstrated an improved first pass success rate (Figure 2)
- Clinicians should consider the routine use of the McGRATH™ MAC VL to reduce the likelihood of difficult intubations regardless of whether a difficult intubation is anticipated.

**FIGURE 1.** Video laryngoscopy is the most frequently selected and successful rescue technique

**FIGURE 2.** First pass success (FPS) rate in McGRATH™ MAC VL vs Macintosh DL in an international multicenter, randomized study (n=2,171)

**Difficult intubations are often unanticipated**
- A recent study of 188,064 intubation attempts found that 93% of difficult intubations (≥3 attempts) are unanticipated
- A meta-analysis of studies evaluating the predictive value of tests for difficult airways revealed surprisingly low sensitivity of these tests (Table 1)

**TABLE 1.** Sensitivity of various test for detecting difficult tracheal intubation

<table>
<thead>
<tr>
<th>Test</th>
<th>Sensitivity for detecting difficult intubation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Modified Mallampati test</td>
<td>0.51</td>
</tr>
<tr>
<td>Thyromental distance</td>
<td>0.24</td>
</tr>
<tr>
<td>Mouth opening test</td>
<td>0.27</td>
</tr>
</tbody>
</table>
**BENEFITS ASSOCIATED WITH MCGRATH™ MAC VIDEO LARYNGOSCOPY AND RELATED EVIDENCE**

<table>
<thead>
<tr>
<th>BENEFIT</th>
<th>BACKGROUND</th>
<th>RELATED EVIDENCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increased first pass success rate</td>
<td>Compared to both direct laryngoscopy and other video-laryngoscopes, improved glottic visualization with the MCGRATH™ MAC video laryngoscope helps clinicians improve first pass success rate.(^1,2)</td>
<td>Review Kriege et al.&lt;br&gt;Review Kline-Brueneggy et al.</td>
</tr>
<tr>
<td>Less hemodynamic instability</td>
<td>▪ Stimulation of the supra-glottic area during laryngoscopy and endotracheal intubation commonly results in sympathetic nervous system activation and subsequent hemodynamic instability(^4)&lt;br&gt;▪ MCGRATH™ MAC video laryngoscope may reduce laryngoscopy-induced hemodynamic instability by facilitating glottic visualization while requiring less manipulation of supra-glottic area(^4)</td>
<td>Review Altun et al.&lt;br&gt;Review Yokose et al.</td>
</tr>
<tr>
<td>Cost effective</td>
<td>Video laryngoscopy for routine use in the operating room is associated with cost savings and fewer adverse events compared to direct laryngoscopy.(^11)</td>
<td>Review Alsumaliet et al.</td>
</tr>
<tr>
<td>Avoid difficult intubations</td>
<td>An ICU study comparing the rate of difficult intubations (≥ 3 attempts) before and after the implementation of routine use of MCGRATH™ MAC VL found a significant decrease in the rate of difficult intubations.(^5)</td>
<td>Review De Jong et al</td>
</tr>
<tr>
<td>Improved performance compared other video laryngoscopes</td>
<td>▪ Compared to King Vision™ video laryngoscope, MCGRATH™ MAC VL is associated with higher first pass success rate and reduced time to intubation(^1)&lt;br&gt;▪ Uses familiar Macintosh blade design unlike hyper-angulated blade utilized by several other video laryngoscopes(^5)</td>
<td>Review Alvis et al.&lt;br&gt;Review: Kline–Brueneggy et al.</td>
</tr>
</tbody>
</table>
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**AVOID Difficult INTUBATIONS**
- De Jong et al.

**IMPROVED PERFORMANCE COMPARED TO OTHER VIDEO LARYNGOSCOPES**
- Alvis et al.
- Kleine-Brueggeney

**STUDY INFORMATION**

**STUDY DESIGN**
International, multicenter, randomized, controlled trial

**METHODS**
- 2,171 elective surgical patients at two institutions were randomized to be intubated with either McGRA TH™ MAC videolaryngoscopy or Macintosh direct laryngoscopy
- The primary endpoint was first pass intubation success
- Secondary endpoints included Cormack and Lehane classification, number or attempts and intubation difficulty score (IDS)

**RESULTS**
- The McGrATH™ MAC VL groups had improved first pass success rate (See figure 1)
- The IDS was >5 more frequently with DL (5.6%) compared with the McGrATH™ MAC VL (1.2%).

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**Kriege et al.**
**Evaluation of the McGrATH™ MAC and Macintosh laryngoscope for tracheal intubation**
*Br J Anaesth. 2020; 125(1): e209*
Kleine-Brueggeney M, et al.
**Evaluation of six video laryngoscopes in 720 patients with a simulated difficult airway: a multicenter randomized controlled trial**

Out of the six instruments that were evaluated, the McGrath™ MAC VL with Macintosh blade was the only one that met the author's primary hypothesis of a 95% confidence interval for first attempt success rate greater than 90%.

### STUDY INFORMATION

**STUDY DESIGN**
Prospective, multi-center, patient-blinded, randomized controlled trial.

**METHODS**
- **Participants:** 720 adults with ASA I-III undergoing elective surgery, n=120 per instrument
- **End Points:** Primary: First attempt success with a lower limit 95% CI of at least 90%. Secondary: Overall success within two attempts, time to intubation, Cormack-Lehane grade, POGO score, intubation difficulty, adverse events, side effects
- **Methods:** Experts with each device performed intubation on patients wearing a size adjustable cervical collar.
- **Instruments (VL):** McGrath™ MAC (#3 Macintosh blade), C-MAC™ (Hyperangulated D-blade), Glidescope™ (Hyperangulated #3 blade), Airtraq™ (Hyperangulated #2/#3 Blade), AP Advance™ (Hyperangulated difficult airway blade), and KingVision™ (Hyperangulated #3 blade)

**RESULTS**

<table>
<thead>
<tr>
<th>Key findings</th>
<th>McGrath™ MAC (n = 120)</th>
<th>C-MAC™* (n = 120)</th>
<th>Glidescope™* (n = 120)</th>
<th>Airtraq™* (n = 120)</th>
<th>AP Advance™* (n = 120)</th>
<th>KingVision™* (n = 120)</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>First-attempt success [95% CI]</td>
<td>98% [92-99] (n = 117)</td>
<td>95% [89-98] (n = 114)</td>
<td>85% [77-90] (n = 102)</td>
<td>85% [77-90] (n = 102)</td>
<td>37% [28-46] (n = 44)</td>
<td>87% [79-92] (n = 104)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Intubation time' (median)</td>
<td>53 sec</td>
<td>56 sec</td>
<td>60 sec</td>
<td>47 sec</td>
<td>93 sec</td>
<td>59 sec</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Soft-tissue injury (n)</td>
<td>6</td>
<td>9</td>
<td>27</td>
<td>19</td>
<td>43</td>
<td>14</td>
<td>&lt;0.01</td>
</tr>
</tbody>
</table>
Review the evidence of the benefits associated with the McGRA TH ™  MAC video laryngoscope

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IMPROVED PERFORMANCE COMPARED TO OTHER VIDEO LARYNGOSCOPES
- Alvis et al.
- Kleine-Brueggeney

**Altun D et al.**

**Haemodynamic Response to Four Different Laryngoscopes.**


**STUDY INFORMATION**

<table>
<thead>
<tr>
<th>STUDY DESIGN</th>
<th>Prospective, randomized controlled trials</th>
</tr>
</thead>
<tbody>
<tr>
<td>METHODS</td>
<td>160 ASA status I-II otologic and rhinologic surgery patients were randomized to be intubated with one of following devices:</td>
</tr>
<tr>
<td></td>
<td>▪ Macintosh direct laryngoscope</td>
</tr>
<tr>
<td></td>
<td>▪ McCoy indirect laryngoscope</td>
</tr>
<tr>
<td></td>
<td>▪ C-MAC video-laryngoscope</td>
</tr>
<tr>
<td></td>
<td>▪ McGRA TH ™  MAC video-laryngoscope</td>
</tr>
<tr>
<td></td>
<td>Patients with features associated with difficult airway were excluded.</td>
</tr>
<tr>
<td>RESULTS</td>
<td>▪ Fluctuations in heart rate and systolic blood pressure associated with laryngoscopy and intubation were less in McGRA TH ™  MAC VL group than the other three device groups</td>
</tr>
<tr>
<td></td>
<td>▪ Patients in the McCoy and McGRA TH ™  MAC VL group had fewer moderate and severe sore throats than the other two groups</td>
</tr>
<tr>
<td></td>
<td>▪ Time to intubation was shorter in the McGRA TH ™  MAC VL group compared to the other three groups</td>
</tr>
</tbody>
</table>
Yokose M et al.  
**McGRATH™ MAC Video Laryngoscope on Hemodynamic Response during Tracheal Intubation: A Retrospective Study.**  

Patients intubated with the McGRATH™ MAC video laryngoscope were 57% less likely to suffer hypertension than patients intubated with a Macintosh direct laryngoscope.

### STUDY INFORMATION

<table>
<thead>
<tr>
<th>STUDY DESIGN</th>
<th>Retrospective trial</th>
</tr>
</thead>
</table>
| **METHODS**  | ▪ 360 patients who were intubated with either McGRATH™ MAC video laryngoscopy or Macintosh direct laryngoscopy were retrospectively identified.  
▪ Patients requiring multiple intubation attempts were excluded.  
▪ Because patients intubated with McGRATH™ were higher risk patients, the likelihood of patients treated with each laryngoscope to suffer hypertension was adjusted according to 16 variables that could potentially influence the incidence of hypertension. |
| **RESULTS**  | ▪ Change in mean blood pressure after intubation was significantly less in the McGRATH™ MAC video laryngoscope group  
▪ The odds of hypertension was significantly reduced in the McGRATH™ MAC video-laryngoscope group  
▪ 18% of patients were intubated with the McGRATH™ MAC video-laryngoscope |
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**IMPROVED PERFORMANCE COMPARED TO OTHER VIDEO LARYNGOSCOPEs**
- Alvis et al.
- Kleine-Brueggeney

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**STUDY INFORMATION**

**STUDY DESIGN**
- Retrospective

**METHODS**
- Researchers developed a model to evaluate the cost-effectiveness of video laryngoscopy (VL) as compared to direct laryngoscopy (DL) for routine use in the operating room
- Model parameters included cost of ownership of VL vs DL, cost of complications, and cost of treatment
- Frequency of intubation related complications for direct laryngoscopy and video laryngoscopy were developed utilizing data from the 2014 Agency for Healthcare Research and Quality Healthcare Cost and Utilization Project (HCUP) database and a comprehensive literature review.
- The model was applied to the simulated intubation of 1,000 patients in the operating room by VL or DL

**RESULTS**

<table>
<thead>
<tr>
<th></th>
<th>VL</th>
<th>DL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of adverse events</td>
<td>38</td>
<td>80</td>
</tr>
<tr>
<td>Total costs</td>
<td>$257,744</td>
<td>$401,074</td>
</tr>
</tbody>
</table>
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**STUDY INFORMATION**

**STUDY DESIGN**
Prospective, single center, before-after study

**METHODS**
- **Participants:** 210 adults in the ICU
- **End Points:** Primary: Incidence of difficult intubation; Secondary: 1st attempt success, number of intubation attempts, Cormack grade, and complications related to the intubation
- **Methods:** 140 consecutive intubations were performed with a traditional direct laryngoscopy approach and then 70 consecutive intubations were performed with the McGrath™ MAC VL. Intubations were performed by operators with a range of experience.

**RESULTS**
- The video technology decreased the incidence of difficult intubations compared to a traditional approach.
- No significant difference in the secondary end points or the experience of the operators. A significant improvement in the Cormack grade was observed when the video technology was used.

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**De Jong A, et al.**
**Implementation of a combo video laryngoscope for intubation in critically ill patients: a before-after comparative study**
*Intensive Care Med. 2013; 39:2144-2152*
Alvis BD, et al.  
*Randomized controlled trial comparing the McGRATH™ MAC video laryngoscope with the King Vision™ video laryngoscope in adult patients*  
*Minerva Anestesiol. 2016; 82(1):30-5*

### STUDY INFORMATION

#### STUDY DESIGN

- **Single center, single blinded, randomized controlled trial**

#### METHODS

- **Participants**: 64 adults with a predicted easy airway undergoing a surgical procedure. (McGRATH™ MAC, n=33; King Vision™*, n=31)
- **End Points**: Primary: first attempt success, time to intubation. Secondary: Oxygen saturation, number of attempts, Cormack grade, assist maneuvers, airway trauma.
- **Methods**: Operators who had performed at least 100 direct laryngoscopies and no more than 10 video laryngoscopies with the randomized instruments were allowed to perform the intubation.
- **Instruments (VL)**: King Vision™* channeled bladed; McGRATH™ MAC VL (#3 or #4 blade)

#### RESULTS

- **McGRATH™ MAC VL** was associated with significantly higher first attempt success rate when compared to King Vision™* (100% vs. 77% respectively, p<0.01).
- No airway traumas were observed with either instrument during this study.
- No significant difference in the number of assist maneuvers or Cormack grade.
- Median time to intubation was less in the McGRATH™ MAC group.
REFERENCES